7

DepED
DEPARTMENT OF EDUCATION

Learning Activity Sheet for Science

Quarter 1

Week

7

DepED MATATAG
Bansang Makabata Batang Makabansa

BAGONG PILIPINAS

DEPARTMENT OF EDUCATION NCR

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Learning Activity Sheet Science Grade 7
Quarter 1: Week 7

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LEARNING ACTIVITY SHEET

Learning Area:	**SCIENCE**	**Quarter:**	**1**
Week:	**7**	**Day:**	**1**
Lesson Title/ Topic:	**Investigating different solutes that can be dissolved in a given solvent**		
Name:		**Grade & Section:**	

Activity 1: Investigating different Solutes that can be Dissolved in a given Solvent

Objectives:

1. Perform investigations on different solutes that can be dissolved in a given solvent.
2. Practice safe handling of materials while performing their experiment.

Activity 1.1 Nature of Solute and Solvent

Instruction(s):
Read the passage and answer the guide questions

> Solutes are considered soluble in the given solvent if they dissolve easily because of their similar nature. Examples are sugar being dissolved in water and salt being mixed with water to form a brine solution. On the other hand, insoluble solutes are those that do not dissolve in the solvent because of the differences in their nature. For example, butter is insoluble in water.
>
> When the two substances are both liquids, the terms miscible and immiscible are used instead.

GUIDE QUESTIONS:

1. Differentiate between soluble and insoluble/ miscible and immiscible. Support your answer with examples.

   _____
   _____
   _____
   _____

2. Does the nature of solute and solvent affect their solubility? Explain your answer.

   _____
   _____
   _____
   _____

Activity No. 1.2: Will the Solutes Will Dissolve?

Group No. 1: **Materials:** clear plastic cups/clear glass, spoon, sugar, water, cooking oil **Procedure:** Setup 1: 1. Put one teaspoon of sugar in a ½ cup of water. 2. Use the spoon to mix the sugar and water. 3. Record your observations. Setup 2: 1. Put one teaspoon of sugar in a ½ cup of cooking oil. 2. Use the spoon to mix the sugar and oil. 3. Record your observations.	**Group No. 2:** **Materials:** clear plastic cups/clear glass, spoon, flour, water, cooking oil **Procedure:** Setup 1: 1. Put one teaspoon of flour in a ½ cup of water. 2. Use the spoon to mix the flour and water. 3. Record your observations. Setup 2: 1. Put one teaspoon of flour in a ½ cup of cooking oil. 2. Use the spoon to mix the flour and cooking oil. 3. Record your observations.
Group No. 3: **Materials:** clear plastic cups/clear glass, spoon, salt, water, cooking oil **Procedure:** Setup 1: 1. Put one teaspoon of salt in a ½ cup of water. 2. Use the spoon to mix the salt and water. 3. Record your observations. Setup 2: 1. Put one teaspoon of salt in a ½ cup of cooking oil. 2. Use the spoon to mix the salt and oil. 3. Record your observations.	**Group No. 4:** **Materials:** clear plastic cups/clear glass, graduated cylinder, or air **Procedure:** Set Up 1 1. Using the graduated cylinder, measure 10 mL of rubbing alcohol and 10 mL of water, respectively. 2. Pour the two liquids into the plastic cup. 3. Use the spoon to mix the alcohol with water. 4. Record your observations. Set Up 2 1. Using the graduated cylinder, measure 10 mL of water and 10 mL of cooking oil, respectively. 2. Pour the two liquids into the plastic cup. 3. Use a spoon to mix the water and cooking oil. 4. Record your observations.

Instructions:

1.Each group will be provided with a set of materials to test whether each pair of substances are soluble or not.

2.Write your predictions in the data table before experimenting.

3.Perform the experiment and record your answers in the data table provided below.

Complete the table below.

Materials	**Prediction**	**Observation**	**Result**
	Will it dissolve? Yes or No	What does the solution like?	Did it dissolve? Yes or No
sugar and water			
sugar and oil			
flour and water			
flour and oil			
salt and water			
salt and oil			
alcohol and water			
water and oil			

Guide Questions

1. Which of the solute-solvent combinations you observed are soluble/miscible? What made you say that the solute is soluble/miscible in the solution? Is it the same with your predictions?

   _____

   _____

2. Which of the solute-solvent combinations you observed are insoluble/immiscible? What made you say that the solute is insoluble/immiscible in the solution? Is it the same with your predictions?

   _____

   _____

3. From the results of your experiment, differentiate soluble from insoluble, and miscible from immiscible.

   _____

   _____

LEARNING ACTIVITY SHEET

Learning Area:	**SCIENCE**	**Quarter:**	**1**
Week:	**7**	**Day:**	**2**
Lesson Title/ Topic:	**DISSOLVING VS. MELTING**		
Name:		**Grade & Section:**	

Activity No. 2: Dissolving VS. Melting

Objective: Differentiate Dissolving from Melting

Activity No. 2.1: Think-Pair-Share

Instruction(s):

Read the given scenarios and answer the given guide questions.

Scenario 1

Students placed sugar cubes into a cup of tea. They watched as the sugar cubes were not visible. The sugar particles have thoroughly mixed with water and was completely dissolved.

Scenario 2

Another group of students observed ice in a glass placed on top of the table. They watched as the ice changed its property. Ice changed from solid to liquid and completely melted.

Guide Questions:

1. What caused the sugar cubes to disappear?

_____
_____
_____

2. What caused the ice to liquify or melt?

_____
_____
_____

3. How does temperature affect the change of sugar to disappear and ice to melt?

_____
_____
_____

4. What happens to the kinetic energy of solid sugar as it dissolves in a cup of tea?

_____
_____
_____

5. How does temperature affect the kinetic energy of ice as it melts and liquifies?

_____
_____
_____

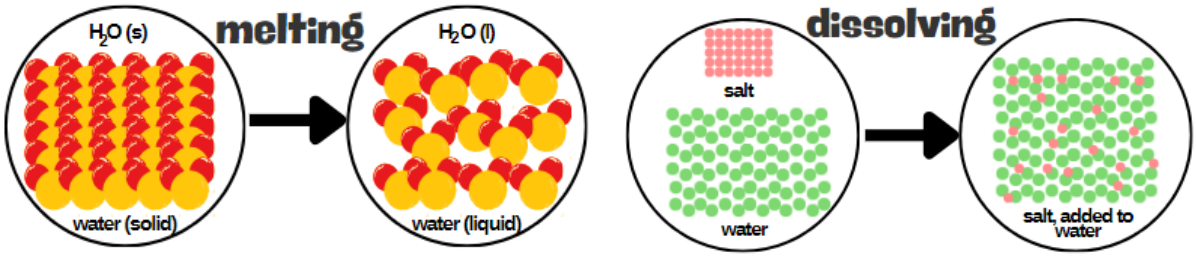
6. Why does dissolving and melting happen in different materials such as in sugar dissolved in cup of tea and melting of ice?

_____
_____
_____

Activity 2.2 Melting and Dissolving

Instruction(s):

1.Differentiate melting from dissolving based on the particle box below and answer the guide questions.



Guide Questions:

1. How are the particles of melting substances from A different from dissolving substances from B?

   _____
   _____

2. What happened to the number of salt particles and the number of water particles when salt dissolved in water?

   _____
   _____

3. Did the particles of salt become smaller or were lost, as shown in the particle box? Explain.

   _____
   _____

Activity 2.2.1

Classify the following by writing D for dissolving and M for melting.

_____1. cotton candy in the mouth

_____2. crushed medicine tablet in water

_____3. chocolate bar exposed to heat from the sun

_____4. sugar cubes in coffee

_____ 5. butter on a plate

LEARNING ACTIVITY SHEET

Learning Area:	**SCIENCE**	**Quarter:**	**1**
Week:	**7**	**Day:**	**3**
Lesson Title/ Topic:	**Percentage Composition**		
Name:		**Grade & Section:**	

Activity 3: Percentage Composition

Objective(s):

1. Differentiate between percent by mass and percent by volume.
2. Calculate the percentage composition by mass/by volume of a given solution.

Activity 3.1: Concentration of Solutions

Read the following and answer the Guide Questions below.

Concentration of Solutions

The concentration of a given solution is described as the measure of the relative amount of solute and solvent it contains. Qualitatively, solutions can be described as diluted or concentrated. A solution is **concentrated** if it contains a relatively large amount of solute in a given volume of solution. A **diluted** solution, on the other hand, contains a relatively small amount of solute. The strong scent of perfumes and the sweet taste of fruit juice are some examples of highly concentrated solutions. The measure of the amount of solute that has been dissolved in a given amount of solvent or solution is called the concentration of solution.

How the concentration is measured or described for a solution depends on the nature of the solutes in the solution and the applications and uses of the solution. The simplest concentrations we see are those listed on the bottles of household chemicals that come in different strengths. These are usually given as percentages.

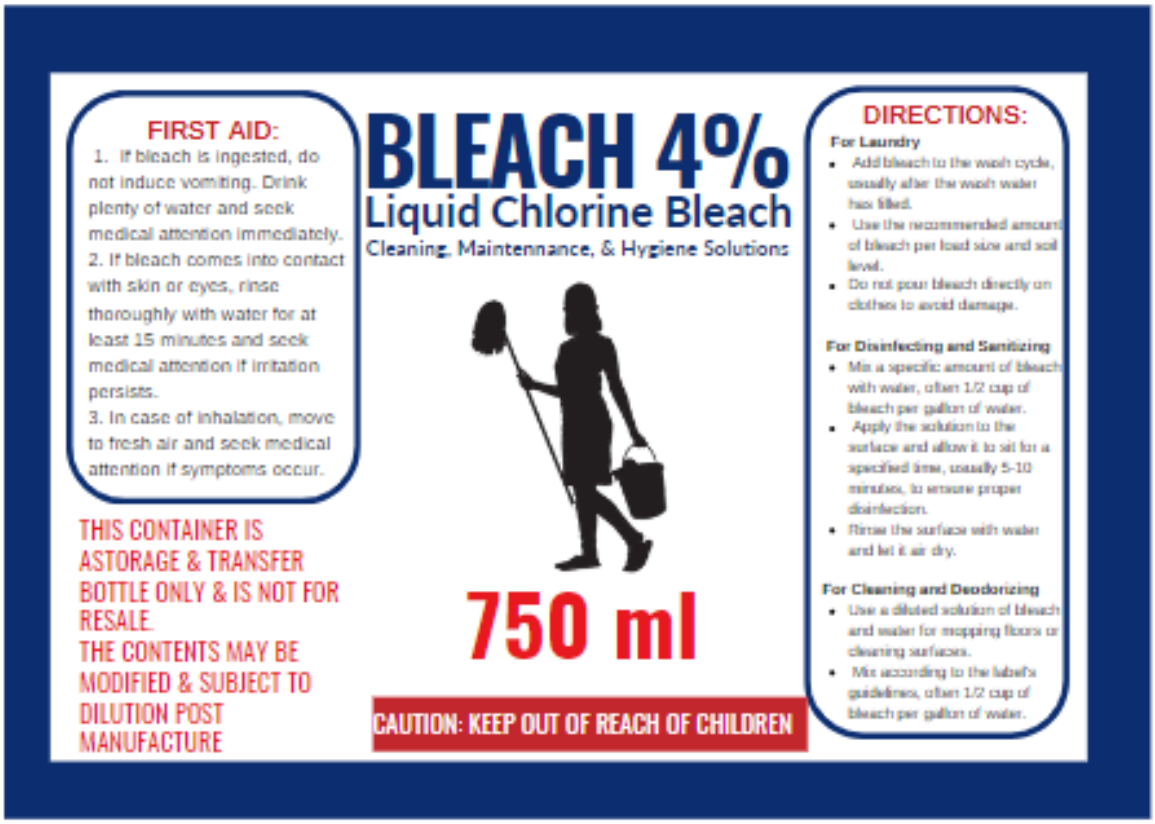
If we were to look in the bathroom or kitchen of our house, we would probably find a bottle of peroxide for disinfecting bleach for cleaning that has a percentage labeled prominently on the front of the bottle. This percentage is a form of quantitative description of concentration that tells how strong that peroxide or bleach solution is. Most household bleaches are labeled 5%. This means if we were to measure out 100 grams of bleach, 5% or 5 grams of that would be the solute, the pure bleach, or sodium hypochlorite. To account for this percentage by mass.

$$\text{\% mass} = \frac{mass\ of\ solute}{mass\ of\ solutions} \times 100$$

When two liquids are mixed, the calculation is a bit different. This is called a volume/volume or (v/v) percent solution, which means that it is the volume of the solute in a volume of the solution. The peroxide we find in our bathroom in a brown bottle is usually a 3% (v/v) solution, which means if we poured out 100 milliliters of it, it would contain about 3 milliliters of liquid hydrogen peroxide, with the remainder being the water solvent. Below is the formula for solving for percentage by volume

$$\text{\% by volume} = \frac{volume\ of\ solute}{volume\ of\ solution} \times 100$$

Source: https://www.learner.org/series/chemistry-challenges-and- solutions/when-chemicals-meet-water-the-properties-of-solutions/



Guide Questions:

1. When do we use mass percent (m/m %) or volume percent (v/v%)?

   _____
   _____
   _____

2. How are the formulas used to solve for percentage by mass and percentage by volume different?

   _____
   _____
   _____

3. What other examples of materials can be found at home that show percentage composition in their labels?

   _____
   _____
   _____

Activity 3.2 Practice Problem

Solve the following percentage composition by mass and by volume.

1. Your mother prepared 25 grams of bleaching powder and 75 mL of water. She asked you to mix the 2 materials. What is the percent by mass of the solution you prepared?

2. In your science class, your teacher demonstrates to the class how to prepare a solution containing 10 mL Hydrochloric acid and 100 mL water. What is the % by volume of the solution prepared by your teacher?

LEARNING ACTIVITY SHEET

Learning Area:	**SCIENCE**	**Quarter:**	**1**
Week:	**7**	**Day:**	**4**
Lesson Title/ Topic:	**Solutions, Solubility, and Concentration**		
Name:		**Grade & Section:**	**7**

Activity 4: Solutions, Solubility and Concentration

Objective(s):
1. Differentiate the three types of solutions as saturated, unsaturated, and supersaturated
2. Identify the type of solution based on the reading selection
3. Predict the type of solution formed based on the amount of solute and solvent present in a solution using the given table.

Activity 4.1: Lily and Her Candies
Read the story and answer the questions below.

Lily and Her Candies

Once upon a time in a bustling kitchen, there was a young chef named Lily, eager to master the art of candy-making for the village fair.

One sunny afternoon, Lily decided to make lemon-flavored lollipops. She heated water in a pot, adding sugar until it dissolved completely. "This is an unsaturated solution," she thought, noticing there was room for more sugar.

With a mischievous grin, Lily added more sugar until the water was saturated. She poured the mixture into molds, creating sweet lollipops.

But Lily wasn't done experimenting. She tried making rock candy, heating water and adding even more sugar. "This is a supersaturated solution," she exclaimed as she watched the sugar dissolve.

Excited, Lily poured the solution into jars and hung sticks in it. As it cooled, excess sugar crystallized, forming beautiful rock candy.

Guide Questions:
1. What are the 3 types of solutions formed by Lily in her candy-making?

   _____
   _____

2. How did she describe each?

   _____
   _____

3. What do you consider when determining the type of solution?

   _____
   _____

Activity 4.2: Identifying Types of Solution

Instruction(s):

1.Study the table below and answer the following questions.

2.Classify whether the solution described is saturated, unsaturated, or supersaturated.

Solutions	Temperature (ºC)	Solubility of Sucrose (g/100g of water)
A	0	179
B	20	230.9
C	50	260.4
D	100	487

1. 50 grams of sugar in a pack were added to 100 mL of water at 20ºC. All of the sugar dissolved, and none settled at the bottom.

_____
_____
_____
_____

2. An additional 200 grams of sugar were added to the same mixture in number 1 with the existing 50 grams of sugar in the mixture, and at 20 ºC, not all of the sugar crystals dissolved, and a few crystals of sugar settled at the bottom.

_____
_____
_____
_____

3. When 300 grams of sugar was added to 100 mL of water at 20ºC, some of the sugar crystals dissolved, and others settled at the bottom. To dissolve the sugar that does not dissolve, the temperature of the solution was increased to 100ºC.

_____
_____
_____